

Infectious Disease Emergence and Economics of Altered Landscapes Program



Photo: D.Schar/USAID

Blood samples from bats are screened for high risk viruses. Such targeted surveillance helps determine pathogen spillover risk and the value of maintaining a healthy ecosystem.

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The United States Agency for International Development (USAID) Infectious Disease Emergence and Economics of Altered Landscapes program is a three-year, \$2 million initiative that investigates how changes to landscapes contribute to disease emergence.

Over 60 percent of emerging infectious diseases over the past six decades—from SARS to Ebola and HIV—have originated in animals, with nearly half linked to land use change, agricultural intensification or changes in food production. Land alterations accelerate the pace and diversity of human and animal contact, enabling pathogens to spill over from animal populations, a first spark in the chain of events that ignite global pandemics. Deforestation and forest degradation account for between 14 to 17 percent of greenhouse gas emissions, equivalent to the entire global transportation sector. A key strategy in reducing the dual threats from diseases of pandemic potential and climate change is a robust evidence base that accurately captures the value of ecosystems.

In partnership with EcoHealth Alliance, a nonprofit organization focusing on local conservation and global health, this program applies data from the Kinabatangan basin in Sabah, Malaysia, and assigns value to an ecosystem's infectious disease regulatory role. The work is expected to produce economically sound strategies to achieve reduced impact land use policy.

COSTING DISEASE EMERGENCE

The program builds upon USAID's investments in pathogen discovery and characterization of disease emergence risk. Leveraging existing data sets and ongoing pathogen surveillance, the program's economic model will project expected costs attributable to disease emergence as a function of land alterations. These costs—from care and treatment, emergency response, and containment to travel and trade restrictions, border closures and market shocks—provide valuable information for discussion among governments, the private sector and civil society to define optimal land use policies. According to the EcoHealth Alliance, preliminary simulations with land use and malaria incidence data from the Brazilian Amazon estimate a \$60 trillion savings over 20 years had land been managed to mitigate disease emergence and maximize ecosystem services.

INFLUENCING LAND USE POLICY

The University of Malaysia in Sabah serves as a training and resource sharing platform, convening roundtable dialogues on the economic relationship between land use change and disease emergence. It acts as a permanent repository for expertise in applying models to inform land use planning. Emerging infectious disease of pandemic potential and unchecked climate change threaten social and economic stability and represent significant impediments to sustainable development. Capturing the economic impact of disease emergence presents an opportunity to promote sustainable land use policies to mitigate these threats, and illustrates USAID's application of science and technology solutions to pressing development challenges.

PARTNERS

EcoHealth Alliance, Sabah Wildlife Department, University Malaysia Sabah, Department of State Health Sabah, Peninsular Malaysia and Sabah authorities.

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